THE X-RAYS AS A THERAPEUTIC FACTOR IN DERMATOLOGY.

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The credit of the first attempt at utilization of the Roentgen Rays as a method of treatment in dermatology must be accorded to Freund of Vienna, who, in 1900, attempted to treat a case of pigmented nevus pileferous which resisted the ordinary methods of treatment. He exposed the area to the rays for two hours daily, and at the end of twelve sittings had the satisfaction of seeing an epilation of the hair. Unfortunately, as a result of excessive exposure, the patient developed an X-ray burn of the third degree, with consequent prolonged healing.

Since then medical literature has been replete with favorable reports on the use of the rays in dermatology, and, at the present date, there can be no doubt as to their therapeutic efficacy.

However, since the first application of the rays to dermatology, they have been applied indiscriminately to every conceivable skin affection and, as is natural, with varying results; but, as a consequence of this, we are now in a position to treat our cases more intelligently. We can tell which cases are suitable for radiation, which are particularly susceptible to it, and also those on which the action is little or none; and we have practically eliminated that bugbear of radiology, the X-ray burn.

The chief drawback to radiotherapy has been the difficulty in determining the dosage to produce a given result, but since we now have the penetrometer, by which we can measure the penetrability of the rays, and the various chloradriometers of Sabourand, Holzknecht, Kienbock and Schiff, which change color in proportion to the amount of the rays absorbed by the skin, we can now adjust our dosage with scientific accuracy. In other words, we may still get a reaction of the first degree, in fact often direct our treatment to that end, but a burn of the third degree is now very rarely seen and practically never in the hands of an experienced operator. But in treatment we find certain parts of the body more susceptible to the rays than others, also different complexions and ages. Generally speaking, the exposed portions of the body, that is the hands and face, react more quickly to the rays, while a blonde will have a more severe erythema following a given dose than a brunette, while the general susceptibility to the rays decreases progressively from infancy to old age. Furthermore, we find, if the diseased and healthy area are treated simultaneously, the diseased area reacts more quickly, with the exception of ulcerated areas, which stand a larger dosage than the adjoining skin without reaction.

As to the choice of tubes for dermatological purposes, the consensus of opinion is in favor of soft tubes, i. e., tubes which show the bones black in the fluoroscopic picture, or generally speaking, a tube that will not back up a two-inch spark gap. Stelwagan starts with a two-inch spark gap and then removes the automatic regulator and allows the tube to rise gradually, claiming thereby to secure a deep as well as a superficial action, while other authorities, as Schiff and Freund, prefer high tubes with frequent treatments. But regarding the length of treatment, distance of the tube from the patient, whether high or low, whether to give the entire dose at one treatment or in a series of treatments, are questions that each individual operator must determine according to his own experience and results. Generally speaking, however, we use soft tubes on superficial lesions and medium hard or hard tubes on the deeper-seated ones. The following law formulated by Kienboch practically covers the subject: The degree of reaction depends on the quantity of the rays striking the skin, and the duration of the period of incubation varies in inverse ratio to the strength of the dose.

To guard against susceptibility on the part of the patient, it is well to follow the plan of Schiff and Freund, who give a preliminary treatment of 10-20 minutes with a medium tube; no reaction following in two weeks, the treatment is commenced.

The patient is placed on a table or couch and, with the exception of the area to be treated, protected from the rays by sheet-lead, covered with cloth or gutta percha, and the tube so adjusted that the area to be treated is parallel to and directly below the platinum mirror of the tube. The nearer the tube the greater the effect; the softer the tube the quicker the effect and vice-versa. Owing to the deleterious action of the rays the operator must also be protected, since it has been found by bitter experience that operators get X-ray burns, chronic radio-dermatitis, also epitheliomata, and according to the investigations of Albers, Shoenburg and Freiben it has been found that the rays have an affinity for the cells of the testicle, producing degeneration of the cells of the spermatic ducts and azoospermia. F. Tilden Brown also reports eighteen cases of sterility in X-ray workers.

To protect the operator doing dermatological work it is sufficient to have a lead-covered screen with a lead glass aperture, the screen being so placed that the operator has access to the switches and rheostat without exposure, or in place of the screen the equally efficient but inconvenient lead glass tube covers may be used. The lead glass tubes on the market are insufficient protection, enough rays penetrating the protected portion to show a fluoroscopic picture.

The action of the rays on the skin is summed up by Pusey in the following manner:

1. Atrophy of the skin and its appendages.
2. Destruction of microbes in living tissue.
3. Alterations of metabolism.
4. Destruction of certain pathological formations.
5. Anodyne action on the pain of certain malignant tumors, neuralgia and puritis.

In view of the small element of danger in the use of the rays, together with the possibility of pigmentation or atrophy of the skin, it is ridiculous to treat every case of acne, eczema, psoriasis or varicose ulcer. In fact, I believe it should only be used where other therapeutic measures have failed, or in cases like sycosis or favus where the time of treatment is materially shortened by its use.

Of all diseases treated by the rays, the most brilliant and undisputable results have been obtained in the treatment of the rodent ulcer type of epithelioma —the advantages of the rays over other methods are multiple—the absence of pain, the ease of application, the cosmetic result and the ability to treat lesions on the nose or eyelids, ordinarily unaccessible to surgery. Since we know that the rays exercise a selective action on rapidly proliferating cells, we are able to destroy the new growth without injuring the embedding healthy stroma. In cases where the edge of the ulcer is surrounded by epithelial perles, the ulcer will often heal, while the elevated border persists. To obviate this I have followed the suggestion of Allen, and now destroy the border with electrolysis or the high frequency spark before applying the rays, and with uniformly good results.

Mikulicz, in a paper read before the Roentgen Congress in Berlin, sums up the treatment of malignant disease by the X-rays as follows:

In cases of cancroid (ulcus rodens) the results are equally as good as excision, as regards the permanency of cure, and far superior as to cosmetic results, especially on the nose and eyelids. With carcinomata of deeper origin, as of the lip, breast, etc., he recommends operation and without waiting for a recurrence; in fact, often before the wound is entirely healed, submits the patient to the rays.

The results obtained in recurrent mammary carcinoma are remarkable; the pain stops, the discharge diminishes, the ulcer cleans and finally heals, while the nodules grow smaller and often disappear. Of course, the disease is not cured, but it is undoubtedly a great advance to be able to so alleviate the symptoms, and it undoubtedly retards the disease and prolongs life.

The parasitic diseases of the hairy parts, as favus and trychophyton, as well as sycosis, non-parasitica, furnish an admirable field for the employment of the rays, since we secure prompt epilation and the majority of the parasites come away with the hairs, leaving the follicles open for medication. The hair returns in from six weeks to three months, and we are often able to secure results in cases absolutely rebellious to ordinary measures. The rays seem to have a further action than simply a means of epilation, the diseased surface improving in appearance before loss of hair takes place.

On account of their depilatory effect the rays have been recommended by Schiff, Freund, Keinbock, Pusey and others for the treatment of hypertrichosis, but in order to get permanent results the hair follicles must be atrophied, which takes one to two years of intermittent treatment. Furthermore, as the result is often accompanied by an atrophic condition of the skin and pigmentation, so it is well to reserve it for the exceptional case.

Alopecia Areata has likewise been treated very successfully, but in so erratic a disease we can not be certain whether the results are due to the treatment or not; certainly the average case is curable by other methods.

Acne Vulgaris offers a favorable field for the employment of the rays, but I do not agree with Pfahler that every case should be so treated. The ordinary case will respond to a sulphur lotion, together with removal of the comedones, or an exfoliating paste, or perhaps the application of the high frequency spark, but the type of acne I refer to is the indurated pustular type that we find on the back and occasionally on the face.

The results, which often do not appear until a reaction of the first degree has occurred, are highly satisfactory and appear to be due to the production of an atrophy of the sebaceous glands and hair follicles.

Another fertile field for the application of the rays is Lupus Vulgaris, where the remedy seems to have a selective action on the Lupus nodules. They become dark red and congested and finally apparently drop out. In small patches on an accessible surface, the Finsen lamp is to be preferred for cosmetic effect, but where large areas are involved, or ulcerated, or where the lesions are situated on the mucous membrane, the X-rays are more practical. Kummel of Hamburg, together with numerous others, have reported a number of cases, and the results are certainly noteworthy and apparently permanent.

In eczema the treatment should be confined to those cases that are resistant to ordinary treatment. Particularly suitable are circumscribed chronic eczemas with an infiltrated base, also the tylotic forms of the sole and palms. Also resistant cases of genital and anal eczema where an immediate relief is obtained from the intense itching.

In lupus erythematosus the results are not as good as lupus vulgaris, the percentage of cured cases being hardly larger than that secured by other methods.

The results in Psoriasis are rapid and certain. The scales falling and the punctate bleeding point disappear in from eight to fourteen days. Hyde and Montgomery report thirty cases with good results, but this method does not prevent recurrences, the only advantage being the quickness and cleanliness of the treatment.

In treatment of the keloid the X-rays give better results than any agent heretofore used. It causes a gradual diminution in size and finally leaves a smooth white scar, and when the pain exists relieves it.

As an example of the anti-pruritic action of this remedy I desire to cite two cases of Prurigo Ferox, in which practical relief from the intense itching was obtained after all other means were exhausted, and also a case of multiple neurofibromata (Von Recklinghausen's disease), accompanied by intense itching, which is satisfactorily controlled by the use of the rays.

I might go on indefinitely citing cases benefited and cured by this agent, but I think there can be no doubt as to the efficacy of radiology in dermatology, i. e., when applied conservatively and properly, and I believe it is a permanent therapeutic factor, the use of which will increase as time progresses.